





Release device for Solar generator hold-down unit

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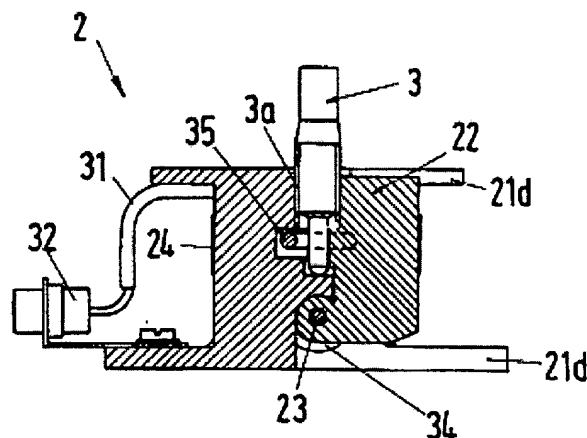
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Abstract of DE19649739

The pre-tension force (37) in the bolt (3) is transmitted via a bolt end thread (3a) into the inner thread (33) of the release element, with the inner thread held half in the release element housing (21) and half in an opener (22). The opener is pivotally inserted in a sector (21d) of the housing, and a wire coil (24), wound around the opener and a housing part (21a), keeps them in position. Opening the coil enables the opener to swing out and thus release the bolt (3). The bolt in the topmost panel is pre-tensioned by means of a nut pressing against a cup component. The ends of the wire coil are held by fuse wires which melt when current is applied to free the opener.



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The invention concerns a release device for a compressor rod, z. B. at solar generators, in accordance with the generic term of the requirement 1.

Such a release device is well-known from the EP 0,716,982 A1. There melting through takes place around both symmetrical parts of wound wire with the help of a heat wire, which is inserted into flange cutouts of the part on the Drahtwicklung resting upon. If the heat wire is set under river, the rolled up wire melts through transverse to the coil direction, whereby the two parts of the device to separate to be able and the pin releases itself. Here the wire coil formed from the Drahtwicklung is torn, the two parts of the wire coil and between the parts pins present is omitted apart downward and/or. fly apart.

Further 28 53 070 a compressor rod system is for distance-oldable or entklappbare carrier elements at space vehicles, in particular well-known for solar generators, by the DE-AS. There a locking bolt is held by the nose of a locking pin in its linked up situation and the locking pin after the release by a blocking element by the pre-loading of the locking bolt is back-pushed. With an execution form used thereby the locking pin is pyrotechnically separated. During this well-known device only a limited holding down strength is possible and the pyrotechnic separation of the locking pin is problematic with space travel devices because of the traumatic effect by pyrotechnics and because of flying around particles.

The invention is not the basis the task to improve a release device of the kind initially specified going by that the pin is to be linked up, the wire after melting through to be omitted can and the pins from the release device led and with the help of its pre-loading is withdrawable.

This task is solved by the characteristics marked in the requirement 1. Favourable arrangements of the invention are characterized in the Unteransprüchen.

The release device according to invention exhibits several advantages. It is substantial that the two parts of the release device do not fall apart when melting through the wire, but only opens unfold and the locking bolts as well as linking up strength the affecting the locking bolt led upward releases. The parts of the release device, the housing and the opener, remain with application for a solar generator at a panel housing connected with the housing. Also the locking bolt can get after the led release not out of control, but in a cap present above the panels is caught. Further advantages of the invention are: The holding down strength is possible to over 13000 N. The release by opening the wire coil by means of Schmelzdrähte takes place at both ends of the wire coil, thus redundantly. Is not necessary pyrotechnic release energy, it no parts are destroyed and the area getting dirty particles set free. The device is sketched in compact building method, a practical application has only one diameter of 56 mm and is 27 mm highly with a weight of 0,084 kg. The device is universal applicable in a temperature range of +-150 DEG C. By the omission of pyrotechnics no particularly trained personnel is necessary.

The invention is described below on the basis a remark example represented in the design. Show:

▲ top Fig. 1 a total view of a compressor rod with a release device;

Fig. 2 the release device in perspective representation;

Fig. 3 an opinion of the release device toward III the Fig. 2;

Fig. 4 an opinion of the release device toward IV the Fig. 2 in half sectional view;

Fig. 5 a cut by the release device toward the lines V-V of the Fig. 2 with one of a wire coil taped openers and

Fig. 6 a cut as in Fig. 5 with opened wire coil and away-swivelled opener.

In the total view of a compressor rod 1 for a solar generator after Fig. 1 with a release device 2 by a locking bolt 3 four panels 4, 5, 6 and 7 are held together. In the highest panels 4 the locking bolt 3 in a Kalotte 12 is stored and with a nut/mother 13 linked up. The locking bolt 3 is screwed in with its lower end into the release device 2.

Into the Fig. the release device 2 is shown 2 to 6 in different representations. A housing 21 consists of a cylinder part 21a and two flanges 21b and 21c. In the housing 21 a perpendicular rectangular cutout 21d is present, in which an opener 22 around a pin 23 is tiltable stored. The pin 23 holds the opener 22 after opening. Around the cylinder part a wire coil 24 is wound of 21a and the opener 22, which is provided at their ends with Schmelzdrähten 25 and 26, which are connected with contact contacts 27 and 28 by conductions 29 and 31. The lines 29 and 31 lead to a plug arrangement 32. Into the release device 2 the locking bolt 3 with a thread 3a is like that that the internal thread 33 to the half in the housing 21 and to the other half in the opener 22 is, this is screwed in from the Fig. 6 particularly well evidently.

If over the lines 29 and 31 a tension is put to the Schmelzdrähte 25 and 26, these melt through, the wire coil 24 spread themselves on (see Fig. 6). Thus the opener 22 becomes free, that under the effect of two laterally 22 spring clips 34

and the linking up strength led present behind the opener on the thread halves the side swivels itself (see Fig. 4 and 6). A clevis 35 inserted into the opener 22 carries the locking bolt forward 3 provided with a tap into the opened position. The clevis 35 and a guide way 38 in the opener 22 lead the locking bolt 3 during withdrawing so long it with the thread 3a within the range of the internal threads 33 are.



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1. Release device for a compressor rod, z. B. at solar generators, which is two-piece implemented and encloses a pin, whereby the two parts with a wire, standing provided with flanges, under pre-loading tapes is, which melts through under effect of heat and releases the pins, by the fact characterized that the two-piece release device (2) consists on the one hand part of a housing (21) and on the other hand part of one into the housing (21) assigned opener (22) that a locking bolt (3) at its is linked up to outstanding end from the release device (2) by toward the axle working Kraft (37) and at its in the release device (2) end present a thread (3a) exhibits, which in to the half in the housing (21) and to the other half in the opener (22) internal thread present (33) is screwed and that the opener (22) is used tiltable in a cutout (21d) of the housing (21), and that when melting through the wire (24) the wire coil formed by the wire (24) opens and falls on the lower flange (21c) of the housing (21), as well as the opener (22) together with the linking up strength (37) the locking bolt (3) out of the release device (2) pulls and up to the complete release leads.
2. Release device according to requirement 1, by the fact characterized that into highest solar panels (a nut/mother (13), oppressive with one on a Kalotte (12), it is linked up to 4) assigned locking bolts (3).
3. Release device according to requirement 1, by the fact characterized that the ends of the wire coil (24) are held by Schmelzdrähte (25, 26), which melt after creation of an electrical tension, whereby the wire coil (24) expands and the opener (22) releases.
4. Release device according to requirement 3, by the fact characterized that the way swivelling of the opener (22) is supported by two laterally the internal thread (33) into the housing (21a) assigned spring clips (34).
5. Release device after several of the requirements 1 to 4, by it characterized that the locking bolt (3) runs out down into a tap (3b), over a clevis (35), inserted into the opener (22), arranged is, and that the clevis (35) pulls the locking bolt (3) when way swivelling the opener (22) out of the internal thread (33), and during pulling out of the release device (2), as long as it in the thread range of the internal thread (33) is, leads.

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